

IN THE CLAIMS:

1. (Cancelled)

2. (Cancelled)

3. (Cancelled)

4. (Currently Amended) ~~The method for manufacturing a semiconductor of~~
~~claim 1~~ A method for manufacturing a semiconductor laser optical device, comprising:
a first step of forming an etching stop layer on a first semiconductor layer; and
a second step of forming a second semiconductor layer made of a group III-V
compound semiconductor on the etching stop layer,

wherein an etching rate for the etching stop layer by dry etching is less than an
etching rate for the second semiconductor layer, and wherein in the first step, the etching
stop layer is a super lattice layer obtained by alternately layering an $\text{Al}_x\text{Ga}_{1-x}\text{N}$ layer
(where $0 \leq x \leq 1$) and an $\text{Al}_y\text{Ga}_{1-y}\text{N}$ layer (where $0 \leq y \leq 1$ and $x \neq y$) on one another,
thereby functioning as a reflector mirror having a thickness such as to reflect light whose
wavelength is equal to or greater than about 360 nm and less than or equal to 500 nm, and
the thickness of each $\text{Al}_x\text{Ga}_{1-x}\text{N}$ and each $\text{Al}_y\text{Ga}_{1-y}\text{N}$ layer is $\lambda / (4n)$ wherein λ
denotes an oscillation wavelength of the semiconductor laser optical device, and n
denotes a refractive index of each $\text{Al}_x\text{Ga}_{1-x}\text{N}$ layer and each $\text{Al}_y\text{Ga}_{1-y}\text{N}$ layer.

5. (Cancelled)

6. (Cancelled)

7. (Currently Amended) ~~The method for manufacturing a semiconductor of~~
~~claim 6, wherein the element included in the group III-V nitride semiconductor is~~
~~nitrogen, and the impurity element is silicon~~ A method for manufacturing a
semiconductor laser optical device, comprising:

a first step of forming an etching stop layer on a first semiconductor layer; and
a second step of forming a second semiconductor layer made of a group III-V
compound semiconductor on the etching stop layer,

wherein an etching rate for the etching stop layer by dry etching is less than an
etching rate for the second semiconductor layer, and the etching stop layer is made of an
insulating film composed of silicon nitride.

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8. (Currently Amended) ~~The method for manufacturing a semiconductor of~~
~~claim 6,~~ A method for manufacturing a semiconductor laser optical device, comprising:
a first step of forming an etching stop layer on a first semiconductor layer; and
a second step of forming a second semiconductor layer made of a group III-V
compound semiconductor on the etching stop layer,

wherein an etching rate for the etching stop layer by dry etching is less than an
etching rate for the second semiconductor layer, the first semiconductor layer includes
magnesium, the etching stop layer is made of an element included in a group III-V
nitride semiconductor and an impurity element that determines a conductivity of the
group III-V nitride semiconductor, and wherein the impurity element is magnesium, and
an amount of magnesium included in the etching stop layer is more than an amount of
magnesium included in the first semiconductor layer.

9. (Currently Amended) The method for manufacturing a semiconductor laser
optical device of claim 8, ~~wherein an impurity concentration~~ the amount of magnesium
included in the etching stop layer is about $1 \times 10^{20} \text{ cm}^{-3}$ or more.

10. (Cancelled)

11. (Currently Amended) ~~The method for manufacturing a semiconductor of~~
~~claim 10,~~ A method for manufacturing a semiconductor laser optical device, comprising:
a first step of forming an etching stop layer on a first semiconductor layer; and
a second step of forming a second semiconductor layer made of a group III-V

compound semiconductor and including Al on the etching stop layer,

wherein an etching rate for the etching stop layer by dry etching is less than an etching rate for the second semiconductor layer,

the method further comprises a third step of performing a dry etching process on the second semiconductor layer, after the second step, wherein in the third step,

the etching process on the second semiconductor layer is stopped upon detecting the etching stop layer, the etching stop layer includes Al, an amount of Al included in the etching stop layer is more than an amount of Al included in the second semiconductor layer, and wherein the third step includes the steps of:

irradiating a surface of the second semiconductor layer with a laser beam;
receiving photoluminescence light emitted through excitation by the laser beam;
and

assuming that a surface of the etching stop layer has been exposed by
~~detecting a change in~~ when a wavelength of the received photoluminescence light
is shortened.

12. (Currently Amended) ~~The method for manufacturing a semiconductor of claim 10,~~ A method for manufacturing a semiconductor laser optical device, comprising:

a first step of forming an etching stop layer on a first semiconductor layer; and
a second step of forming a second semiconductor layer made of a group III-V compound semiconductor and including Al on the etching stop layer,

wherein an etching rate for the etching stop layer by dry etching is less than an etching rate for the second semiconductor layer,

the method further comprising a third step of performing a dry etching process on the second semiconductor layer, after the second step, wherein in the third step, the etching process on the second semiconductor layer is stopped upon detecting the etching stop layer, the etching stop layer includes Al, an amount of Al included in the etching

stop layer is more than an amount of Al included in the second semiconductor layer, and
~~wherein~~ the third step includes the steps of:

irradiating a surface of the second semiconductor layer with X rays;

measuring a diffraction angle of the X rays; and

assuming that a surface of the etching stop layer has been exposed by
~~detecting a change in~~ when the diffraction angle ~~of the X rays~~ increases.

13. (Cancelled)
